

## Digital Literacy: Comparative Review on Machine Learning Based Performance Assessment of Students

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### Abstract

The E-learning system paved an opportunity to make drastic changes in the educational system all over the world. Several institutions began to implement online learning to offer internet based courses contrary to the traditional classroom teaching. These online courses tends to provide several potential benefits such as flexibility and opportunities, to discover knowledge of the students. It also offers innovations in learning strategies of the students and resolve several complexities by accessing information from internet. Though e-learning based systems produces certain advantages, they also possess limitations of co-operative learning, active learning and performance mitigations. To address these issues, the present study focused on the different AI based techniques used in the prediction of student's academic performance. The main objective of the study is to analyze the primary factors that affects the learning through online and analyze the performance using different intelligent approaches. A comparative study of the AI based techniques is performed to analyze the different methods involved in the assessment of academic performance. Further, the present issues and future works of the studies is deliberated to produce optimized analysis systems. This tends to support several researchers to overcome the disputes and provide effective e-learning assessment systems.

**Keywords:** E-Learning, Academic Performance, Online Assessment, Distributed Learning Circumstances

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### 1. Introduction

The concept of e-learning involved in transforming the higher education using disruptive technologies [1]. This e-learning concept is one of the differentiating tools, which are used by many universities because of their focus on the student interaction based on several technologies, and permits the students for accessing information in an easier manner [2]. Moreover, the concept of digital learning allows both the synchronous and the

asynchronous learning modules, only having a viable access to the internet [3]. E-learning has an impressive growth with a reliable context to the advent of technological advancements, especially in the fields of education, by integrating them to the tripod, comprising technology, education and the economics [4]. Moreover, the modality of teaching presents the advantages such as low cost, deliberated allocation of time to study and self-management over each of the concepts. This enables the flexibility to be consistent and to be a standardized platforms [5]. By 2015, the market of e-learning was estimated up to 165 billion USD having an average annual growth range of 5%, from the year of 2018 to

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e-learning can be paralleled with the track development of the internet, their design, and content. Currently, the concepts of e-Learning envelopes wide range of field concepts and tools such as, mobile learning, applicable modules, and blended form of learning. This includes fast learning, scrolling telling, quiz sessions held online and webinars. Other such concepts like, interactive video sessions, Nano-learning, are also implied via e-learning. In context of these proliferation standardization bodies of educational and research sector are constantly working to enhance and to finalize the quality of standards which should be highly respected and adapted by the institutions using e-learning platforms. Moreover, the employment of an online based training and learning system are in need technical intervention, human knowledge, and effective pedagogical resources. These should be synergized and should be able to provide education to each of the distant learners. To achieve this respective priority, it is one of the potential aspects to control the requirements which are related to the device to make more use of it [25].

Many of the academic institutions are relied excessively upon the traditional form of teaching practices. But once after the pandemic times, each of the educational domains are said to shift towards the emergence mode of online teaching concepts [26]. This is due to the fact that these concepts are separated and are unintegrated with two probabilistic negative effects. Initially, the students and the teachers experience the solutions at varying contexts, where the educational community from various university departments, from teachers to the students, whereby the digitalization of the subjects focused only on the concepts of learning in new aspects and in redefining each of the domains. Since these solutions are separated and are fragments, both the students and the teachers experienced the same in various digitalized tools, which limited themselves in sharing a digitalized learning space [27]. Followed by, this separation should be constituted to a hindrance, to innovate a new learning forms, which was echoing each of the traditional patterns such as lectures and reading books. Thus, the overall separate processes are simulated using the incremental improvement which failed in creating a disruptive changeovers [28].

#### **4. Significance of performance assessment in e-learning**

During the COVID pandemic initiated in Wuhan city, by 2019, made a drastic effects upon social distancing which created a huge impact on each of the sectors such as industries, education and in business sectors. The education is one of the most affected sectors in the pandemic times. Nevertheless, the various development in the

technology has implied a positive impact over the educational sectors in aspects of delivery and in qualifying the educational system. The significance provided by the e-learning has been a potential advantage which aided each of the students to pursue the education without any breakouts. Alternatively, during the times of pandemic, all of the work and the educational culture were changed from campus to the home based learning. This had a massive change on the teaching and the learning which are based on the present economic factors, and unstable forms of network connectivity. But the positive parts of significance created by the e-learning modalities, tutorials in video formats and the other essential experimental simulations such as online examinations, consultations, online courses and the necessary motivation features for the enlighten the career of students [29]. This study concluded that the students are motivated by the digital learning process which aims in achieving their learning goals. Moreover, the impact of digital marketing upon each of the student perspective have been discussed in the study. A discussion upon the perspective of teacher is followed. Furthermore, teaches faced number of challenges during the implementation of the digital form of learning platforms. The conventional study has explored the readiness of the faculties to teach via digital modules for classroom sessions. These sessions are interpreted based on three various aspects such as the pedagogical, physiological and the technological aspects. Similarly, the suggested study [30] was investigated based on the self-perception and the ability for the adaption of digital form of learning phases among professors. The quantitative approach for the study resulted in a positive influence, upon the digital competence and the levels of self-confidence were increased upon the adaption of digitalized learning.

Whereas, this suggested approach has been with a perceived interaction, the other educational materials and the perceived use of digitalized platforms in Saudi Kingdom, during the pandemic, and their analyzing upon the students satisfaction using the e-learning modules. The study has been completely based on the structural equation modelling (SEM), and the effective route analysis. These were done using the data collection from an e-learning user. According to the statistics from the study, both the Student happiness and the yearning to make use of e-learning had a positive impact on actual use. The perceived interaction and the self-efficacy were to be the potential factors influencing the perceived usefulness and ease of use, which simultaneously affected the student intentions and the satisfaction from e-learning [31]. Correspondingly, the suggested approach has intended in exploring the relationship among the relationship among the service, e-trust and the quality with the e-loyalty in areas of Vietnam, which



















admired to the transition of learning systems, they also possess some challenges.

Online learning can be overwhelming. Leading to increased stress due to a heavier workload and difficulties in maintain self-regulation and self-motivation. Many students struggle with time management skills, which can exacerbate these feelings. Additionally, a lack of technical knowledge and the challenge of adapting to ever evolving technologies further complicate the learning experience. Educators also face the challenges of implementing effective assessment techniques to accurately analyze student performance in this dynamic environment.

From reviewing several studies, it is understood that academic performance analysis has been negatively affected. So, there is an urge to mitigate the performance and satisfaction level of the students. It is obvious that different researchers have put their efforts in investigating and establishing the theoretical concepts by using various models. But these methods lack in identifying the factors that influence the low performance of students and ways to mitigate the issues. So, an optimised analysis system of AI based methods with enhanced precision is crucial to predict the academic performance of students under virtual learning.

## 10. Conclusion

The student's performance analysis in e-learning circumstances is significant to predict the challenges accompanied in the development of knowledge. Though online courses offers several benefits, the students also face some issues. To mitigate these problems, the present work reviewed several traditional and AI based approaches involved in the academic performance analysis of student's. A comparative analysis of different AI based techniques was deliberated with their corresponding outcomes. Additionally, the study also projected the critical analysis based on the concept of "AI based techniques in the performance assessment of student's" and "Year-wise distribution of studies". Further, the research gaps were analysed from the studies and deliberated along with the present issues and future works. It was observed that the online learning is as effective than classroom learning, but there are essential portions that has to be overcome and make e-learning more optimised. This present study attempted to divulge the challenges in ensuring the efficacy of e-learning, which tends to guide several researchers in the enhancement of different approaches.

## 11. Declaration

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